Seed Rescue

Home Connection

Dear Family,
During the last few days, your child worked with a team to make a model of a pollinating tool that could be used to pollinate plants in a greenhouse. They acted just like engineers! To make the model, they. . .

- identified and learned about a problem
- planned ways to solve the problem
- made a model
- tested the model
- thought about their test results and made a new plan

In this exploration, your child learned about engineering design and science concepts such as plant life cycles and the parts of flowers. Your child also practiced mathematics and science skills. The teams measured lengths, calculated costs of materials, planned and conducted an investigation, used quantitative data to make comparisons, and made claims supported by evidence.

Talk with your child about the project. If your child needs help telling what happened, ask prompting questions, such as

- What was the problem you were trying to solve?
- What did you learn about flowers and seeds?
- Why are pollinators important to plants?
- What materials did you use to make your model pollinator?
- How did you know if your model pollinator was successful?

On the other side of this page, work with your child to find out more about what the team did in this exploration.

This STEM project has been developed in partnership with Texas A&M University.

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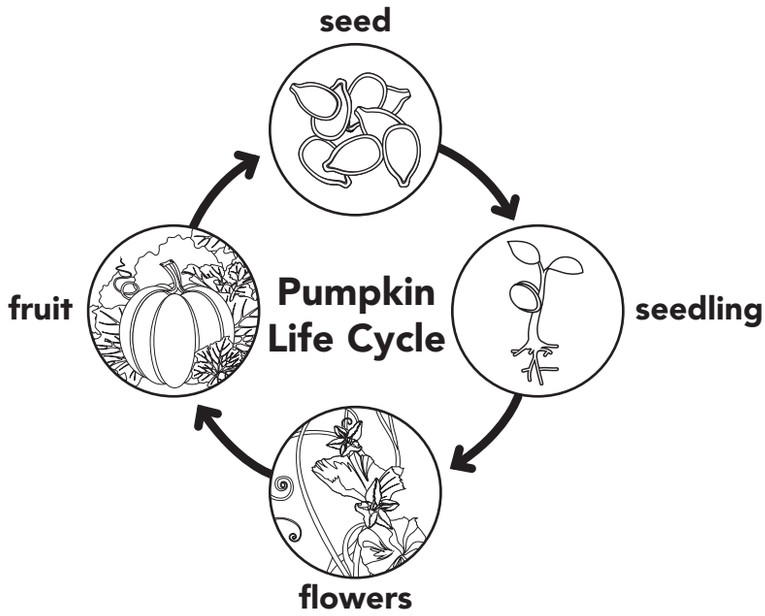
Home Connection

Plants and Pollination

In this activity, children learned about the role of pollinators in the life cycle of plants. Have your child use the art below to explain why plants need pollinators.

Ask: *What are the different parts of a pumpkin life cycle? Why are bees important to a pumpkin plant?*



Try It!

Investigate the structure of simple flowers, such as a lily, tulip, or daffodil. Have your child point out these parts: stamen, pistil, stigma, ovary. **Ask:** *Which part of the flower makes pollen?* (stamen) *Which part holds pollen because it is sticky?* (stigma) You may need to remove one or more petals to show the ovary. **Ask:** *Where do the seeds grow?* (ovary)

If you have access to a flower garden, visit it with your child. Watch for pollinators visiting flowers. You may see bees, flies, butterflies, moths, or even hummingbirds. Notice which flowers each pollinator visits. Make a list of what you see. Do different pollinators visit different kinds of flowers? Can you observe any patterns?

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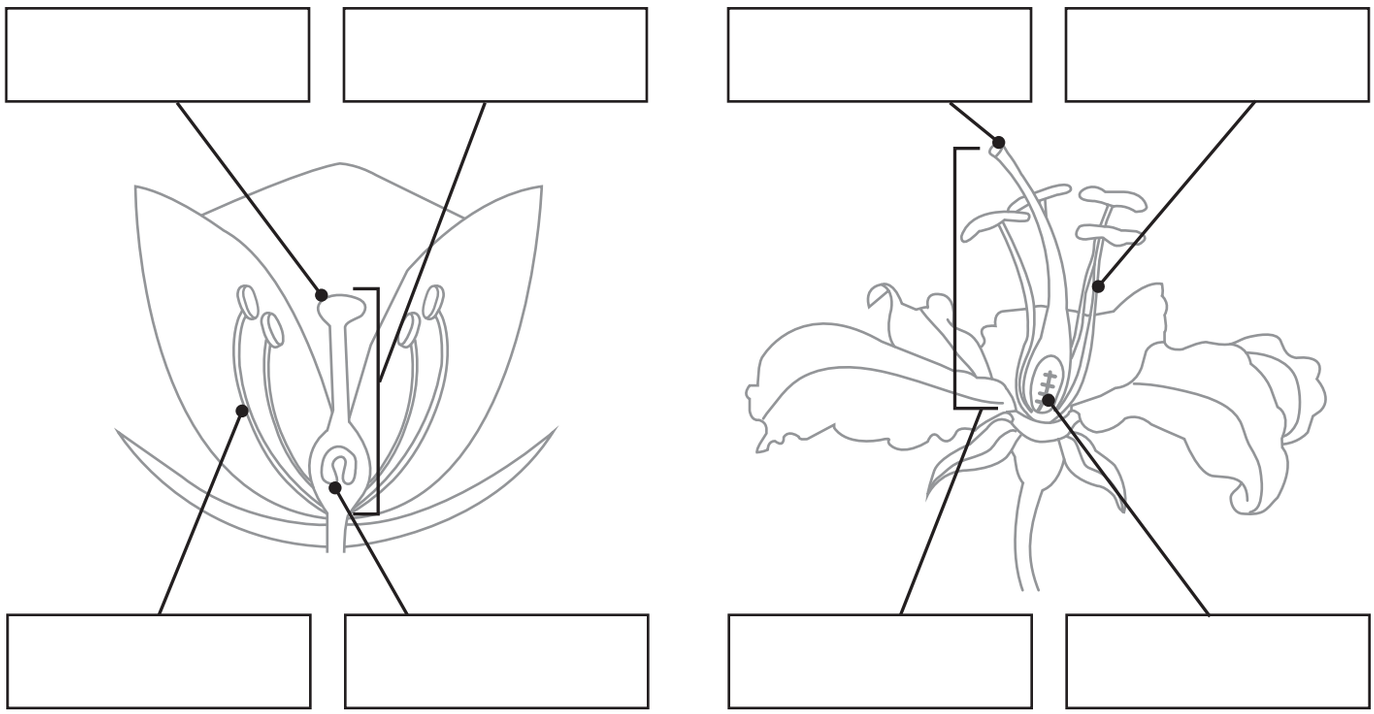
Flower Parts

Name _____

Follow these steps.

1. **Look** at the fabric flowers. Compare them to the picture on page 9. Find the parts of the fabric flowers.
2. **Identify** Label the parts on each flower: **pistil**, **stamen**, **stigma**, **ovary**.



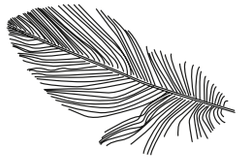
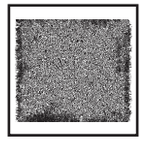
3. **Draw** a line to what each part does.

Pistil	Female part where seeds grow
Stamen	Female part that includes stigma and ovary
Stigma	Male part that makes pollen
Ovary	Female part that collects pollen

How Many Pollen Grains?

Name _____

Write your results and answer the questions.

Pumpkin flower	Material	How many pollen grains stuck?	How many pollen grains fell?
1			
2			
3			
4			
5			

1. **Compare** Which material carried the most pollen grains to the poster? Put a star next to it.

2. **Compare** Which materials held pollen grains so tightly that they did not stick to the poster? Put an X next to them.

Compare Handle Materials

Name _____

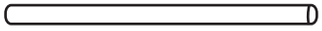
Write your results and answer the questions.

1. Circle the materials that bend easily.
   Then measure the length of each material.

_____ inches

_____ inches

_____ inches



_____ inches

_____ inches

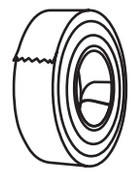
_____ inches

2. **Write** the materials you would like to use in the table.
   Write their length, too.

Name of Material	Length
	Total Length:

3. **Think** Which materials could you add together to equal at least 16 inches?

4. **Compare** Circle the connectors that worked best.



Pollinator Plan

Name _____

Follow these steps.

1. What materials will you use to move pollen grains? Why?

Materials to move pollen	Reason for choosing

2. What materials will you use to make the handle? Why?

Handle materials	Reason for choosing

3. **Draw** a picture of your pollinator. Label the materials.

Cost of Materials

Name _____

Material to move pollen	How many?	Cost of one	Total cost of material
Example: Fur	3	15¢	15¢ + 15¢ + 15¢ = 45¢
Feather		12¢	
Fur		15¢	
Pom-pom		10¢	
Loop fastener		15¢	
Pipe cleaner		8¢	
Total cost of these materials			

Handle materials	How many?	Cost of one	Total cost of material
Small craft stick		5¢	
Large craft stick		10¢	
Thick straw		20¢	
Thin straw		14¢	
Clothespin		15¢	
Pipe cleaner		8¢	
Straw connector		17¢	
Total cost of these materials			

The total cost of pollinator materials is _____.

Test the Pollinator

Name _____

Use your team's model pollinator. Follow these steps.

1. **Measure** Use the ruler to measure the handle. Our handle is _____ inches.
2. **Test** Stand behind the line. Use your pollinator to pick up pollen grains from the male flower cup. Carry the pollen to the pumpkin flowers.
3. **Test** Dab your pollinator on the first pumpkin flower. Count the pollen grains that stuck. Write the number in the table. Leave the pollen grains on the poster.
4. **Test** Take turns moving pollen grains from the cup to each pumpkin flower.
5. **Add** Find the total number of pollen grains that stuck to the pumpkin flowers.

Pumpkin flower	Number of pollen grains stuck to flower
1	
2	
3	
4	
5	
Total	

Reflect On It

Name _____

Use your team's Pollinator Plan and Test the Pollinator pages to answer the questions.

1. Our model met these goals:

   ☐ Moved at least 25 pollen grains to the flowers.

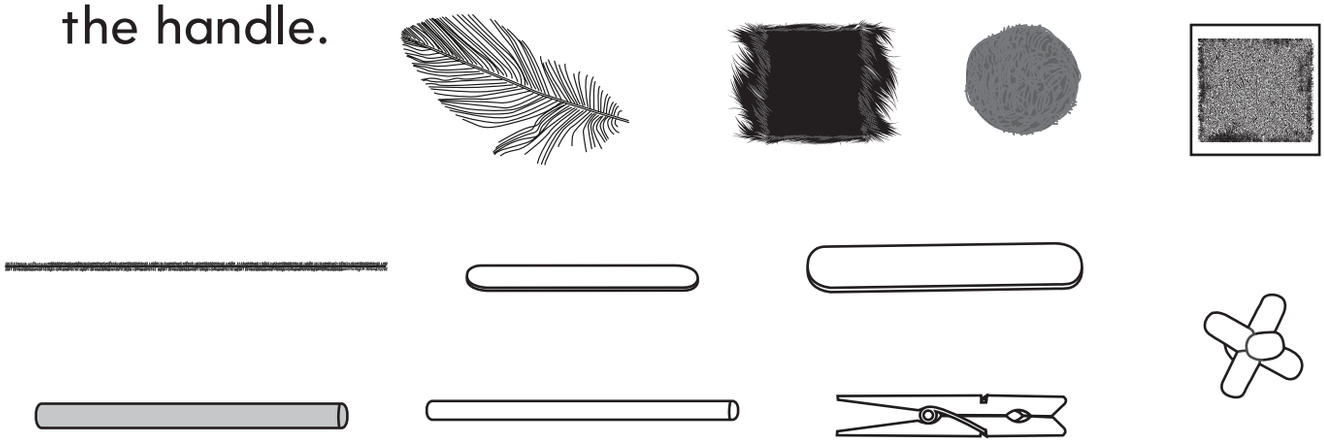
   ☐ Handle is at least 16 inches long.

2. Our plan was successful because _____

   _____

   _____

3. Think about the other team plans. Circle materials that were used most often to move pollen grains. Put a box around materials that were used most often in the handle.



4. What did you learn from others that might make your model more successful? _____

   _____